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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,462	09/25/2003	Robert B. Hosler	02-1908	9744

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ECKERT SEAMANS CHERIN & MELLOTT, LLC
ALCOA TECHNICAL CENTER
100 TECHNICAL DRIVE
ALCOA CENTER, PA 15069-0001

EXAMINER

VERBITSKY, GAIL KAPLAN

ART UNIT PAPER NUMBER

2859

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/672,462	Applicant(s) HOSLER ET AL.	
	Examiner Gail Verbitsky	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02/16/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 30 has been renumbered claim 29, and "claim 29" in line 1 of the renumbered claim 29 has been replaced with --claim 28--.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 16-18, 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Bates (20030193988).

Bates discloses in Fig. 1 a device/ molten bath testing probe comprising a body comprising a pair of integrally formed sample receptacles (chambers) 12 and 14 for holding a sample of the molten metal. Each receptacle receives a thermocouple 40 and 42 respectively. The device also comprises an analyzer 50 electrically connected to the

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thermocouples for determining a difference in temperature between thermocouples and thus samples in each receptacle. Both receptacles are positioned (initially submerge) into a molten bath by means of a handle (central portion) 34. Then the receptacles are removed from the molten bath. Bates teaches to measure the change in temperature between the receptacles after they are removed from the molten bath, and integrating the difference in temperature over a time period.

The molten material is an aluminum smelting material (bath). The device is to determine aluminums concentration.

The handle, receptacles (body) can be made of stainless steel.

The method steps will be met during the normal operation of the device stated above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5-6, 9, 10, 13, 16-18, 20, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates (U.S. 20030193988).

Bates discloses in Fig. 1 a device/ molten bath testing probe comprising a body comprising a pair of integrally formed sample receptacles (chambers) 12 and 14 for holding a sample of the molten metal. Each receptacle receives a thermocouple 40 and 42 respectively. The device also comprises an analyzer 50 electrically connected to the

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thermocouples for determining a difference in temperature between thermocouples and thus samples in each receptacle. Both receptacles are positioned (initially submerge) into a molten bath by means of a handle (central portion) 34. Then the receptacles are removed from the molten bath. Bates teaches to measure the change in temperature between the receptacles after they are removed from the molten bath, and integrating the difference in temperature over a time period (determining the rate of heating or cooling).

For claim 6: the molten material is cryolitic material (electrolyte).

For claims 9, 17-18: the handle, receptacles (body) can be made of stainless steel.

For claims 5: Since the device is not a disposable device, it is inherent, that the steps can be repeated with the use of the same device/ body.

Bates does not teach that the molten material solidify after the body is removed from the molten bath, as stated in claim 1, to allow the molten material to cool while measuring the temperature of the cooling molten material, and measuring the second temperature when the cooling rate changes, as stated in claim 10, cooling the molten material and the reference material while measuring a temperature of the cooling molten material, as stated in claim 24.

Wall teaches to allow the sample of the molten metal to solidify after it is removed from the molten metal bath (col. 7, lines 53-64) and measure its temperature during liquidation phase and solidification phase (cooling, freezing) (col. 8, lines 39-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method, disclosed by Bates, so as to cool

the sample to allow it to solidify, as taught by Wall, so as to allow the operator to obtain a dynamic data of the sample, in order to properly analyze the concentration and other characteristic data of the material of interest.

The method steps will be met during the normal operation of the device stated above.

6. Claims 4 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of Nakashima et al. (U.S. 5037211) [hereinafter Nakashima].

Bates discloses the device as stated above.

Bates does not explicitly teach that the thermocouple is a K-type thermocouple.

Nakashima teaches to use a K-type thermocouple to measure temperature of the molten metal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the thermocouple, disclosed by Bates, with the K-type thermocouple, as taught by Nakashima, because both of them are alternate types of the thermocouples which will perform the same function, of measuring the temperature of the molten metal, if one is replaced with the other.

The method steps will be met during the normal operation of the device stated above.

7. Claims 1-3, 5-8, 10-12, 15-20, 22-23, 24-25, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates (U.S. 6220748) [hereinafter Bates 2].

Bates discloses in Fig. 2 and entire col. 2, a device and a method in the field of applicant's endeavor, wherein the method including contacting a molten material

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(aluminum smelting bath) bath with a probe/ body/ conduit made of a stainless steel having a test conduit (receptacle) and a reference conduit (receptacle) and respective test sensor 30 with a test thermocouple and a reference sensor 20 with a reference thermocouple connected by a single handle (integrally) 44, removing the reference and test sensors from the molten material, detecting temperature difference between the sensors as the sample material cooled down, e.g. to 250⁰ C, cooling rate (temperature difference to time) is determined in order to determine concentration of (test material) aluminum smelting/ NaF:AlF₃ concentration. The reference material 23 can be any suitable stable material, i.e., aluminum, stainless steel in a form of solid (col. 3, lines 2-3 and col. 2, line 61).

For claim 7: Also, the differential temperature profile shows the temperature at which liquidus begins to freeze. In addition, the amount of superheat can be obtained (col. 4, lines 1-16). The liquidus temperature of the test sample indicates the temperature at which the molten sample begins to freeze (solidify).

For claim 11: Bates measures a first temperature with the temperature sensors, and a second temperature, wherein the second temperature is a liquidus temperature at a peak temperature (i.e., when the cooling rate changes).

For claim 8: By determining the liquidus temperature of the test sample, the superheat or over-temperature of the bath can be determined (col. 6, lines 1-5).

Bates states that the device can be used for other types of material, in a broad sense suggesting that the device is reusable, and thus, that the material should be removed

from the sample receptacle after repeating all the steps of the method, and before using the receptacle/ body for another method (before re-submerging).

The method steps will be met during the normal operation of the device stated above.

8. Claims 13-14 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates 2 in view of Clark et al. (U.S. 3882727) [hereinafter Clark].

Bates 2 discloses the device as stated above in paragraph 7.

Bates 2 does not explicitly teach to reheat the sample and to remove the sample from the receptacle, and that the device is reusable, as stated in claims 13-14 and 26-27.

Clark discloses in Figs. 1-2 a device in the field of applicant's endeavor, wherein a sample container (receptacle) comprising a temperature sensitive means which is adapted to engage a sample during a test by a holding force, the holding force is released when the temperature sensitive means and thus, sample is re-heated after the test (col. 4, lines 51-59 and col. 5, lines 13-19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention, disclosed by Bates 2, so as to allow the operator to engage and disengage the sample in the container (receptacle), as taught by Clark, in order to avoid damaging the container, when the sample expand, and, thus. make the device re-usable, in order to minimize the manufacturing costs. The method steps will be met during the normal operation of the device stated above.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods.

Any inquiry concerning this communication should be directed to the Examiner Verbitsky who can be reached at (571) 272-2253 Monday through Friday 8:00 to 4:00 ET.

GKV

Gail Verbitsky

Primary Patent Examiner, TC 2800



July 30, 2004